

09/348,169
DOCKET NO. FQ5-404

21

REMARKS

Claims 1-50 are all the claims presently pending in the application. Claim 1 is amended to more clearly define the invention. Claims 1, 4, 13, 40, and 45-50 are independent. Claims 4-36, 38-41, and 43-50 are allowed. Of the rejected claims, claim 1 is independent.

These amendments are made only to more particularly point out the invention for the Examiner and not for narrowing the scope of the claims or for any reason related to a statutory requirement for patentability.

Applicant also notes that, notwithstanding any claim amendments herein or later during prosecution, Applicant's intent is to encompass equivalents of all claim elements.

Entry of this §1.116 Amendment is proper. Since the Amendments above narrow the issues for appeal and since such features and their distinctions over the prior art of record were discussed earlier, such amendments do not raise a new issue requiring a further search and/or consideration by the Examiner. As such, entry of this Amendment is believed proper and Applicant earnestly solicits entry. No new matter has been added.

Applicant gratefully acknowledges the Examiner's indication that claims 4-36, 38-41, and 43-50 are allowed. However, Applicant respectfully submits that all of the claims are allowable.

Applicant gratefully acknowledges the Examiner's indication that claim 37 would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims. However, Applicant respectfully submits that all of the claims are allowable.

Claims 1-3 and 42 stand rejected under 35 U.S.C. § 103(a) over as being unpatentable

09/348,169
DOCKET NO. FQ5-404

22

over the D'Amico, et al. '100 reference, in view of the D'Amico, et al. '593 reference, and further in view of the Gitlits reference and yet further in view of the Barlett et al. reference, and in even further view of the Shi reference.

This rejection is respectfully traversed in the following discussion.

I. THE CLAIMED INVENTION

An exemplary embodiment of the claimed invention, as defined, for example, by independent claim 1, is directed to an automobile communications method for an on-board mobile station across a plurality of radio zones which are consecutively arranged along a road. The method includes providing each of the radio zones with a plurality of M communication frequencies, providing N plurality of time slots in one period in each of the radio zones, switching between the M communication frequencies within each of the radio zones using a time division scheme such that a different one of the N time slots is allocated for adjacent radio zones for each of the plurality of M communication frequencies by sequentially switching from one to another at a time of every N/M time slot.

As explained by the present specification, conventional communication systems use a Time Division Multiple Access (TDMA) communication protocol in which different time slots are used at the same frequency. These TDMA systems enable a wide frequency range to be used. However, it is necessary to increase transmission power by an amount which corresponds to the increase in noise to obtain a desired carrier to noise ratio. Additionally, various distortions deteriorate performance. Further, wide-band devices are needed.

By contrast, the present invention provides a novel system having advantages of both Frequency Division Multiple Access (FDMA) and TDMA systems by arranging a plurality of

09/348,169
DOCKET NO. FQ5-404

23

M frequencies in each radio zone and switching these M frequencies in a time division mode within each radio zone and also by switching one of N time slots for each frequency between adjoining radio zones so that individual mobile stations do not have to switch frequencies within a single radio zone.

Rather, each mobile station can communicate continuously using the same frequency within a single radio zone across the plurality of radio zones merely by switching the time slot. In other words, continuous communication is allowed at the same frequency for a mobile station within a single radio zone and the frequency range of each of a plurality of frequencies is substantially equivalent to that of an existing FDMA system.

Additionally, the present invention has a further advantage in that interference between adjoining zones can be avoided. Each zone communicates using a plurality of M frequencies and switches between these plurality of M frequencies in time division manner which is coordinated with adjoining radio zones so that adjoining radio zones do not communicate simultaneously using the same frequency.

In this case, as long as the same frequency is not selected at the same time between adjoining zones, then time slot positions used in adjoining zones are arbitrarily selected. In other words, it is not necessary to select different time slots between adjoining zones. On the other hand, when a communication frequency is switched, if the same frequency can be selected at the same time between adjoining zones, then different time slots are allocated between adjoining zones.

The present invention provides the above objects and advantages by providing N plurality of time slots in one period in each of the radio zones, switching between the M communication frequencies within each of the radio zones using a time division scheme such

09/348,169
DOCKET NO. FQ5-404

24

that a different one of the N time slots is allocated for adjacent radio zones for each of the plurality of M communication frequencies by sequentially switching from one to another at a time of every N/M time slot.

II. THE 35 U.S.C. § 112, FIRST PARAGRAPH REJECTION

The Examiner alleges that claim 1 does not comply with the written description requirement. While Applicant submits that such would be clear to one of ordinary skill in the art to allow them to know the metes and bounds of the invention, taking the present Application as a whole, to speed prosecution claim 1 has been amended in accordance with Examiner Ly's very helpful suggestions.

In view of the foregoing, the Examiner is respectfully requested to withdraw this rejection.

III. THE PRIOR ART REJECTION

The Examiner alleges that the D'Amico et al. '593 reference would have been combined with D'Amico et al. '100 reference and further that the Gitlits reference would have been combined with the combination of the D'Amico et al. '593 reference and the D'Amico et al. '100 reference and goes even further to allege that the Barlett et al. reference would have been combined with the combination of the D'Amico et al. '593 reference, the D'Amico et al. '100 reference and the Gitlits reference and yet further alleges that the Shi reference would have been combined with the two D'Amico et al. references, the Gitlits reference and the Barlett et al. reference to form the claimed invention.

Applicant submits, however, that these references would not have been combined and

09/348,169
DOCKET NO. FQ5-404

25

even if combined, the combination would not teach or suggest each and every element of the claimed invention.

None of the applied references teaches or suggests the features recited by independent claim 1 including a system and method that provides N plurality of time slots in one period in each of the radio zones, switching between the M communication frequencies within each of the radio zones using a time division scheme such that a different one of the N time slots is allocated for adjacent radio zones for each of the plurality of M communication frequencies by sequentially switching from one to another at a time of every N/M time slot.

The Shi reference does not teach or suggest the features of the claimed invention including sequentially switching from one to another at a time of every N/M time slot. Rather, as illustrated by Figure 1b of the Shi reference, the Shi reference does not even disclose handover between radio zones of a wide-area radio zone.

Rather, within the radio zone that is formed by a radio access node (RAN) 12, a plurality of frequencies are concurrently used to make communications as illustrated by Figure 4. The Shi reference clearly does not teach or suggest the feature of sequentially switching from one to another at a time of every N/M time slot.

The Examiner does not allege that any of the other references remedy this deficiency, let alone teach or suggest sequentially switching from one to another at a time of every N/M time slot.

Indeed, the Examiner admits that none of the D'Amico et al. '100 reference, the D'Amico et al. '593, reference and the Gitlits reference teaches frequencies that are sequentially switched from one to another at a time of every N/M time slot. (Pages 7-8, October 24, 2004, Office Action).

09/348,169
DOCKET NO. FQ5-404

26

Therefore, the Examiner is respectfully requested to withdraw the rejection of claims 1-3 and 42.

IV. FORMAL MATTERS AND CONCLUSION

In view of the foregoing amendments and remarks, Applicant respectfully submits that claims 1-50, all the claims presently pending in the Application, are patentably distinct over the prior art of record and are in condition for allowance. The Examiner is respectfully requested to pass the above application to issue at the earliest possible time.


Should the Examiner find the Application to be other than in condition for allowance, the Examiner is requested to contact the undersigned at the local telephone number listed below to discuss any other changes deemed necessary in a telephonic or personal interview.

09/348,169
DOCKET NO. FQ5-404

27

The Commissioner is hereby authorized to charge any deficiency in fees or to credit any overpayment in fees to Attorney's Deposit Account No. 50-0481.

Respectfully Submitted,

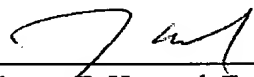
Date: 9/29/05
James E. Howard, Esq.
Registration No. 39,715

**MCGINN INTELLECTUAL PROPERTY
LAW GROUP, PLLC**

8321 Old Courthouse Road, Suite 200
Vienna, Virginia 22182-3817
(703) 761-4100
Customer No. 21254

CERTIFICATION OF FACSIMILE TRANSMISSION

I hereby certify that I am filing this Amendment After-Final Rejection Under 37 CFR §1.116 by facsimile with the United States Patent and Trademark Office to Examiner Nghi H. Ly, Group Art Unit 2686 at fax number (571) 273-8300 this 29th day of September, 2005.


James E. Howard, Esq.
Registration No. 39,715